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Agriculture on Aruba

Aruba is one of the leeward islands in the Netherlands Antilles located at 70° West longitude, 12°30' North latitude. It is nineteen miles in length and six miles in width, and according to the last census, 1966, the population of Aruba is 59,316. The most outstanding characteristic of the Aruban economy is that nearly all goods for domestic consumption are imported. "The agricultural sector does not contribute significantly to the domestic product because of the climate (Investment Factors: Netherlands Antilles. Page 21)."

Aruba's climate is desert-like: the mean maximum and minimum temperatures are 86° and 78° F., respectively; the mean wind velocity is 16 mph (the heaviest winds occur during the dry season, February through September); and the mean-annual rainfall is 16.8 inches (5.3 inches falls during the dry season, 11.5 inches during the wet). It is the combination of the temperature, wind velocity, and the inadequate rainfall which causes the arid conditions on Aruba, which, consequently, results in little productive agriculture.

In the past, the Arubans suffered through the droughts and famine throughout the years. In the early 18th century when crops failed, Curacao supplied provisions to Aruba (Hartog. Page 67). Horse and cattle ranching were Aruba's primary source of income. They were permitted to roam freely to graze. The horses were exported to Cuba and Jamaica where they were

sold for NAF 300.00 (\$159.00) (Hartog. Page 75).

Throughout the 19th century, the Arubans continued to suffer through the droughts. In 1816, the Committee to Receive Bonaire and Aruba from the English Governor, after the drought of 1790-1815, decided to give up on agriculture and try cattle raising. The Arubans were ordered to confine agriculture to maize and fruits in staked-out plots for the sustenance of their households (Hartog. Page 124).

And into the 20th century, the droughts continued (Hartog. Pages 225-229, 249). One of the severest droughts began in 1912 and continued until 1920. People were dying from malnutrition and from disease caused by the lack of sanitary drinking water. Food, which came from Curacao, Venezuela, and Colombia, was rationed. As late as the 1930's, it was necessary to obtain the kitchen surplus from the Lago Refinery and to obtain food from the Pope in Rome and from the Netherlands.

Not until the late 19th century was the Aruban, who through the centuries was dependent upon the poor soil and the desert-like climate for his sustenance, freed from the laborious and unrewarding toil of the farmer and enabled to earn money for his sustenance. Gold had been discovered in the early 19th century, and in subsequent years the Aruban earned money by means of the tributer system. At first the Aruban gave up farming only during the dry seasons, but eventually he gave up farming altogether (Hartog. Page 223). And with the arrival of the oil and chemical industries, and with the expansion of tourism, the number of farmers continued to decline. In 1910

there were 1,314 farmers; in 1920, during a severe famine period, there were 222 farmers (Hartog, Page 162). In the 1966 Census Report, at a time when 16.5% of the working population was unemployed, there were only 153 farmers, which represents a mere 1% of the people employed. A recent survey conducted by the Veternaire Dienst, the government department responsible for agriculture, fisheries, and food control on Aruba, disclosed that the average farm, which is one to two hectares (approximately 2½ to 5 acres) in size, was worked on a part-time basis. The survey also disclosed that more than 60% of the farmers are over fifty years of age, some farmers are between thirty and forty, and none are under thirty. People, other than the farmers, grow crops, such as peanuts, Aruban cucumbers, maize, some sweet corn, and sorghum, in their yards and mostly to supplement their income for little work, particularly peanuts which are high-priced and which have high yields in small fields. They plant in, and during, the rainy season; they do not water, but rely solely upon the rainfall.

The vast majority of Arubans, therefore, purchase their food, either food that is grown locally, or that which is imported. Generally, the food that is imported is inexpensive and comes from South America. The imported food presents serious competition to the local farmers. Since there are farmers on Aruba who can compete against this import market, despite the desert-like climate, a survey was made to determine how this group succeeds. Two of the farms surveyed, the Aruba Hydroponic Enterprises N.V. and the "Chinese Plantation" at

Fontein, conduct ~~a~~ large-scale vegetable businesses. Two other farms surveyed, the Webó Fresco and Emanuel S. Viera's, conduct large-scale poultry businesses, the Webó Fresco in eggs, Viera's in broilers. Mr. Viera also raises goats. Another farm surveyed, Esi Wever's, conducts a large-scale pig business. The sixth farm, Marcello Croese's, is a dairy (milk) farm where fruits and maize are also grown. The office of the Veternaire Dienst was included in the survey to discover the extent of the government's involvement in agriculture and the measures, if any, that the government is taking to assist^s the farmers and to promote agriculture.

The Veternaire Dienst

The Veternaire Dienst is headed by Dr. G. De Vries, who came to Aruba and heads the department since 1966. He is responsible for agriculture, fisheries, and food control. In addition to inspecting fruits vegetables, dairy products, and livestock, his department also imports cattle from Venezuela and Colombia for the local Aruban markets only (~~since~~ no cattle is raised on Aruba due to the high cost of feed and the lack of pasturage), and slaughters all livestock. To assist the farmer, the Veternaire Dienst provides advice and performs such services as plowing fields, for a daily fee of Naf 25.00 (\$ 13.25) which is below cost, and tanki building to provide water storage for gardens, fruit trees, and livestock. In 1968 the department built approximately fifteen tankis. He states that these tankis are not really feasible since it is costly for the farmers to

transport water from the tankis to their farms. Also he believes that digging wells is not reasonable, because the soil is generally shallow, and when too much sweet water is extracted, brackish water enters the well.

To promote agriculture, the Veternaire Dienst currently has a program for conservation and operates an experimental farm, the purpose of which is to eliminate the goat from Aruba and replace it with the pig. Dr. DeVries believes that the only area satisfactory for agriculture is the rectangle formed by lines drawn from Oranjestad, Noord, Bushirani, and ~~Santa~~ ^{San} Cruz. Within this area, he states that the soil is shallow, generally only about a foot thick, and that there is severe soil erosion just east of Hooiberg. To provide erosion control in this area, and throughout the island, a reforestation program has been proposed. He states that planted trees and shrubs would not only prevent soil erosion and improve the water retention properties of the soil, but the trees and shrubs would also serve as windbreaks to reduce evaporation and to protect the plants from wind damage. The Department of Parks and Landscaping carried out an experiment in reforestation which proved to be 80% effective.

Dr. De Vries also proposes to eliminate the goat from the island since the feeding habits of the goat contributes to soil erosion, and since the raising of goats is not economically feasible. Each goat needs one fourth to one third of a hectare (approximately three-fourths of an acre) for foraging; the goat produces only one goat per year; the goat is sold for NAF 5.00 (\$13.25) which is a profit of only nine or ten dollars per goat. He proposes to replace the goat with the pig. The Veternaire

Dienat would breed the pigs and sell the piglets to the people who would then fatten and breed them. He believes that the raising of pigs is economically feasible. The pig remains in pens and is fattened by left-over food; the pig produces a litter; and the pig can be slaughtered at six or seven months of age when it has reached a maximum of ninety kilos (198 pounds) for a good profit. He states that there is a steadily increasing pig market and that he hopes that there will be a change from the raising of goats to the raising of pigs.

The Hydroponics Farm

The ^{hydro}hydronics farm was constructed at Paradise and placed into operation February 1st, 1958, because of the poor soil, lack of adequate groundwater, and lack of sufficient horticultural products for the people of Aruba (A.A. Steiner. Pages 3,4). The government operated the farm until January 1st, 1969 when it was leased to its present owners, the Aruba Hydroponics Enterprises N.V.

The hydroponics farm is on five hectares (12 acres) of land of which three and two-tenths hectares (8 acres) are used as growing space. This space is divided into twelve units. Gourds, tomatoes, cucumbers, peppers, beans, corn, and ocre are grown there, 25% of which is sold wholesale, 75% retail. In June, 1967, only six units were in use and business was mostly wholesale. In 1969, ten units are in use; this reflects basically an increase in retail sales.

Eighteen field workers are employed as it requires approximately two men to each unit. The workers are mostly school "dropouts" who have no experience in farming. They receive training and work on the farm on an average of four years when they leave to obtain better jobs. Their work week is six days, seven and a half hours per day. The highest paid field worker, a sprayer, receives NAF 1.25 (\$.76) per hour. The only mechanical equipment is a machine to spray weed killer.

Operating the hydroponics farm is an expensive proposition. Since there is an inadequate rainfall, it is necessary to purchase metered water to carry the nutrients and to use in the irrigation system. Water costs two dollars and eight cents per one thousand gallons, approximately one fourth of the operating costs of the farm, and must be used to water the plants every day that there is not a significant amount of rain.

It is necessary to also overcome the climatic factors of temperature and wind velocity. To protect heat-sensitive crops, such as peppers, he grows a heat-tolerant crop, gourds, above the peppers to provide shade. To protect his crops from the wind, he has tall, slatted, plastic or palm frond covered fences placed in strategic locations.

Mr. Jones' principal complaint is that the government does not protect Aruban prices. (Mr. Robert L. Jones is the Managing Director of the firm.) He stated that his greatest competition comes from the Venezuelan market. As an example, he compared the prices of tomatoes. The Venezuelan tomato sells for NAF .22 (11½¢) a kilo (2.2 lbs.), ungraded, while

his tomatoes must sell for Naf .40 (21¢) a kilo. Mr. Jones stated that even without government price protection the quality of the hydroponics tomatoes competes successfully with the quantity of the Venezuelan tomatoes.

The Chinese "Plantation"

The Chinese "Plantation" is located on the north shore, at Fontein, where a fresh water spring, the only moving fresh water on Aruba, is located. In two historical reports, 1816 and 1885 (Hartog. Pages 122,123,187), references are made to the spring and to the successful farming there. The man who manages the farm appears to be about sixty years of age. He emigrated from China thirty-two years ago. A language barrier prevented a satisfactory interview with the respondent. Much of the information was obtained from observation.

The farm is approximately two to three acres large, and it is worked by eleven Chinese field hands. Mustard greens, parsley, cabbage, celery, lettuce, tomatoes, beans, onions, eggplants, nutmeg, peppers, turnips, swiss chard, mushrooms, squash, and watercress are grown for the wholesale market. All work is done manually except for a rototiller. This work includes some watering (most is done through an irrigation system) which is accomplished with a shoulder yoke which has a large, dangling sprinkler can on either end.

The fresh water spring solves the problem of inadequate rainfall: it is used as the source of supply for an extensive irrigation system. Spring water is pumped into four storage tanks which are used to distribute water throughout the farm.

through a system of valves and gates. Advantage is taken of the fact that the farm lies downgrade of the spring. The crops are irrigated every day that there is no significant rainfall.

Since the farm is located on the windward side of Aruba, the cooling effect of the wind eliminates any problem of temperature. The wind, though, is a climatic factor that must be dealt with as there is a problem not only with the velocity, but also with the salt spray which is carried by the wind. To protect the crops from the wind, slatted fences on which palm fronds are attached are distributed throughout the farm; to protect the crops from the salt spray, taller slatted fences on which plastic sheets are attached are placed in strategic locations.

The respondent could convey the information that very hard work is involved in farming.

The Egg Farm

Mr. Basilio Wever manages the Webó Fresco Poultry Farm at Modanza which, he says, is the number one egg producing farm on the island. He manages the farm for his brother, Esi Wever, an Esperanza supermarket manager, who owns the farm. (Mr. Esi Wever also owns a pig farm. See below.) Mr. Basilio Wever, who is approximately forty-five years of age, was a former taxicab driver. He started the farm in 1951 with twenty-five chickens; up to 1966, the farm had two hundred laying chickens. Today the farm operates with between five and ten thousand laying chickens which are housed in four buildings, and which lay

between three hundred and four hundred dozen eggs daily. Some of the eggs are sold in the Esperanza supermarkets; a large proportion are sold wholesale. His high production rate is responsible for meeting any competition; it is possible to sell his eggs for Naf .90 (\$.48) per dozen wholesale as opposed to his competitors' prices of Naf 1.10 (\$.58). A "by-product" of the farm are the chickens which have become too old for egg laying; when the chickens of a building attain the age of eighteen months, the whole building of chickens are sold live for Naf 1.25 (\$.66) each and are replaced. Mr. Wever purchases chicks from Miami, Florida and has them in readiness for egg laying by the time that he is ready to sell the eighteen-month-old chickens.

The farm is operated by Mr. Wever with the assistance of two families. They all work long hours, up to ten o'clock at night. Mr. Wever earns Naf 600.00 (\$318.00) monthly, and because of his successful management, he has received offers of double his salary to work elsewhere. Feed and water are purchased for the chickens. The chickens are fed by an automatic, timed feeder, and are watered by an automatic water trough. The farm also has an automatic grader-candler-washer machine which, Mr. Wever states, is the only one on either Aruba and Curacao.

Mr. Wever uses good management practices. He imports Kimber chicks, a type of leghorn, from Miami, which are suitable for the Aruban climate; the buildings are oriented on the farm to use to advantage the cooling effect of the trade winds; wind

barriers are erected to protect the chickens from the velocity of the wind; automatic machinery is utilized to conserve the expensive feed and water; an automatic grader-candler-washer machine ensures quality control.

Mr. Basilio Wever is actively engaged in finding suitable property on which to build his own egg farm. He feels that he has eighteen years of successful farming experience, and expects that many of the wholesale customers will continue to purchase his eggs when he establishes his own business. He believes that he will also grow vegetables on his own farm; he intends to grow the vegetables between the poultry buildings. On the Webo Fresco farm he noticed that weeds grow well on the ground between the buildings. He believes that the buildings act as wind barriers to protect the vegetation both against wind damage and against the drying effects of the wind. He noticed also that along the ground underneath the edges of the building it is moist. This area receives water spillage from above as the chickens' watering trough runs alongside the outside walls of the buildings. He believes that vegetables will grow there. If after experimenting he finds that the water spillage does not provide sufficient moisture for his crops, he plans to construct an irrigation ditch down the centerline of each area between the buildings.

Mr. Wever had two complaints about the government: he feels that the Veterinaire Dienst is not sufficiently experienced in poultry farming, and therefore he cannot turn to them for advice, and he feels that, though his farm successfully meets competition from the *import* market, the government should impose import duties.

The Broiler and Goat Farm

Mr. Emanuel S. Viera, who is approximately forty-five years of age, has a farm in Tanki Leendert on which he raises broilers and goats. He emigrated from British Guiana (now Guyana) in 1939 to work at the Lago Refinery, and was laid-off in 1960. Since 1960 he is an agent for a United States feed concern. Mr. Viera stated that he has always been interested in agriculture, and had always had a farm. His present farm consists of two adjoining plots, one three hectares (7.4 acres), the other seven hectares (17.3 acres), both of which are leased from the government at three dollars per two hectares annually. The three hectare plot is utilized for the raising of broilers; the seven hectare plot is used for the grazing of his goat herd.

Mr. Viera has one poultry building which houses two thousand broilers. At one time he had as many as ten thousand. He operates his farm with the help of his wife and two school-age sons. When he slaughters broilers, about once a week, he hires between eight and twelve workers to assist. They hold other jobs; he hires them only for the slaughtering and pays them "piece-work" wages. The bulk of his trade is wholesale.

He had begun construction for two more buildings to enlarge his operations but had changed his mind as he feels that raising broilers are no longer profitable, and he is considering giving up the broilers altogether. He gave two reasons for the growing unprofitability: cost of feed and competition from abroad. Feed, which is 80% of the cost of production, is not grown on Aruba; *it is* imported from the United States, and ^{or} what he considers a premium. *In the United States*, a bag of feed costs three to

four dollars, on Aruba six to seven dollars. His second reason is that he finds it difficult to meet the competition from abroad, principally Norway and the United States. Imported chicken is sold in parts and can be purchased at Naf 5.00 (\$2.65) for five pounds. His chickens, which must be sold at Naf 1.00 (\$.53) a pound wholesale, are sold at Naf 1.25 (\$.66) a pound retail. He cannot compete because he has no market for the chickens' backs: the Arubans do not buy chicken backs.

On his seven hectare fenced-in plot, Mr. Viera has a herd of thirty-six goats and kids. They graze and also receive a supplementary feed. Contrary to Dr. De Vries, he believes that the goats are good for the Aruban economy and that the goat is definitely profitable. In his experience with his herd, his goats do "drop" two kids per year, one each six months. And as they continue to mature, they "drop" two kids in less than a year and are carrying a third before the year is out.

Mr. Viera is interested in going into goat dairy farming, as he believes that there is a market for goat milk on Aruba. He is interested in a particular breed of goat which can adapt to the climate and which can yield up to two gallons of milk daily. He states that the yield in goat's milk is greater proportionately than cow's milk.

Mr. Viera had two complaints. He feels that the Veternaire Dienst is not equipped to provide him with sufficient information, that his practical experience outweighs their theoretical knowledge. And he would like the government to impose duties to protect the farmers. He had organized a poultrymen's association which had petitioned the government for such protection but to no avail.

The Pig Farm

Mr. Romolo, who is approximately sixty years of age, manages a pig farm which is located in Santa Martha. It is known as the Esperanza Farm, but it is owned by Mr. Esi Wever who is a manager of an Esperanza supermarket. In 1942 Mr. Romolo emigrated from Venezuela where his parents were farmers. He has never done any

other kind of work. He has ten children, all of school age, who help him on the farm.

The pig farm is two hectares (4.94 acres) large and has two hundred pigs. The pigs are both bred and fattened on the farm, and when they attain a weight of between one hundred and thirty and one hundred and forty kilos (268 to 308 pounds), they are slaughtered and sold to the Esperanza supermarket. Depending upon the size and weight, between one and three pigs are slaughtered daily.

There are no problems in the operation of this farm. The pig is a common Aruban breed which is well adapted to the climate. Since each pig consumes between two to three kilos (4.4 to 6.6 lbs.) daily, feed could be an expensive item. Since the pig requires no special diet, the pigs are fed the garbage and food leftover at a military post and at the Esperanza supermarkets. The pigs receive no supplementary food. The pig requires no special care.

The Dairy, Fruits, and Maize Farm

Mr. Marcello Croese is a farmer who owns two farms in Santa Cruz. He is sixty years old and has been a farmer for the past forty years. His father and grandfather were farmers; out of seven brothers, Mr. Croese is the only one who went into farming. He well remembers the years of famine, 1914-1921. He thinks that it is foolish for people to work at something other than farming and not be able to afford to eat well, and says that he feeds his family better by farming than he would by working for Lago Refinery. He works his farm fulltime with the help of his wife and children.

On the one farm, one acre in size, fruits and maize are grown. The fruits are melons, mangoes, papaya, zurzask, and maispal which are harvested the year round. To protect the fruit trees from the wind, Mr. Croese constructed a wind barrier on the windward side of each tree. There is a well which yields three thousand gallons of water, slightly brackish, daily. The well is the source of supply for a modified irrigation system. The water

is used to water the fruit trees and only a small section of the maize field. The other section of the maize field is dependent upon rainfall. This section, which is harvested once a year during the rainy season, produces a two year supply of grain for his family. The section of the maize field that is watered from the well is harvested three times a year. He had stored in drums a three year supply of maize. Maize is one of his most profitable crops; he sells it for NAF .25 (\$.13) per kilo (2.2 pounds).

On Mr. Croese's other farm, which is seven acres in size, and which is a mile from his one acre farm, are two Holstein milking cows, a calf, and one young bull. He finds his dairy farming very profitable. His two milking cows yield twenty-two liters (5.8 U.S. gals.) daily; each liter is sold for NAF .90 (\$.48). This whole seven acre farm is used for a pasture for the cows to forage for whatever vegetation is available. To supplement their diets, each of the cows are given grass which is grown around the well area on the one acre farm, and twelve pounds of a purchased grain.

This seven acre farm has no well nor source of water other than the metered water. Mr. Croese would like to drill two wells on the property. He said that a man using a divining rod found water on the property. A man from Curacao who has well-digging equipment had quoted a price of NAF 3,600 (\$1,908) for digging two wells. Other people in the neighborhood were interested in having wells dug also, but the man never returned. If the wells get dug and water is found, he would get eight to ten additional milking cows. If a great deal of water is found, he would grow more maize for feed and would raise cattle for beef. The only beef that he sells now are the bulls. It is too expensive to feed a bull and have it only for infrequent breeding. Therefore, after a cow is bred and "drops" a bull, the older bull, which is usually one year old, is sold for beef and brings NAF 400. (\$212.).

Mr. Croese wanted the government to provide protection, but could not express what he had in mind. And he would like the Veterinaire Dienst to obtain well-digging machinery.

After centuries of adverse climatic conditions, a small group of people are still actively farming. Of the farmers surveyed, all but one, Viera, were doing so successfully, and he had plans for the future. The survey disclosed that those most successful are those that have water available: the hydroponics farm, the Chinese "Plantation", and Marcello Croese's farm; or have low overhead, such as the pig farm for which no feed is bought; or those, even though they have high overhead or stiff competition, succeed through good management practices.

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